

REMARKS/ARGUMENTS

The Office Action mailed April 17, 2003, has been received and reviewed. Claims 9 through 18 and 20 through 23 are currently pending in the application. Claims 9 through 18 and 20 through 23 stand rejected. Applicant has amended claims 9, 10, 12 through 14, 16 through 18, 20, and 21, and respectfully requests reconsideration of the application as amended herein.

35 U.S.C. § 112 Claim Rejections

Claims 9 through 18 and 20 through 23 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Applicants respectfully traverse this rejection, as hereinafter set forth.

The Office asserts that the specification does not provide support for the claim limitations of a substrate or substrate surface that is “substantially planar.” Applicant respectfully disagrees with this assertion, as such substrate features are clearly depicted in FIGS. 4, 5, and 15 of the specification. Furthermore, the Office asserts that the substrate surfaces depicted in the figures are non-planar “due to the openings formed therein which occupy a large fraction of the surface.” (Office Action at page 2, third paragraph.) The openings referred to by the Office, however, are separately recited in claim 9 as being “an aperture including a seat portion opening onto said first substantially planar surface of said one-piece substrate.” Therefore, the Office has improperly characterized the openings depicted in the figures as forming part of the recited “substantially planar surface.”

While it is believed that all the limitations of the claims are sufficiently described in the specification, Applicant has amended the specification to describe a substrate that is of “one-piece” construction having substrate surfaces that are “substantially planar.” The amendments to the specification do not add any new matter and are supported at least by FIGS. 4, 5, and 15 as originally filed.

In view of the foregoing, Applicant respectfully submits that claims 9 through 18 and 20 through 23, as amended, are allowable under the provision of 35 U.S.C. § 112, first paragraph.

Claim 13 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse this rejection, as hereinafter set forth.

The Office has indicated that the claim 13 limitation of “at least one conductive trace is formed within an intermediate conductive plane” is indefinite. For purposes of clarification, Applicant has amended claim 13 to recite that the conductive trace “is formed on an intermediate plane within said one-piece substrate.” This amendment is supported in the specification in FIG. 11 and at page 16, paragraph [0054]. Accordingly, Applicant respectfully submits that claim 13, as amended, is allowable under the provision of 35 U.S.C. § 112, second paragraph.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,229,320 to Haseyama et al.

Claims 9 through 12, 14 through 16, 18, and 20 through 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haseyama et al. (U.S. Patent No. 6,229,320). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

Haseyama et al. discloses an IC socket 200 mounted on a test board 32 and having a contact unit 23 including a plurality of contact pins 30 for engaging solder bumps 28 on an IC device 25. Contact unit 23 may include various features such as elastic member 31, 31A, positioning plate 36 with recesses 38, positioning parts 52A, 53A or guide plates 41 and 42 for retaining contact pins 30 and positioning of solder bumps 28 (Figs. 7-19). Haseyama et al. further discloses that contact pins 30 may have a spiral part 63 for contacting solder bumps 28

(Figs. 21A-21B and col. 15, lines 31-53). The opposite ends of contact pins 30 pass out of the underside of the socket body 21 and are configured to connect to land parts 33 on test board 32, or in the alternative, to have elastically deformable parts 71, 72, 73 inserted into through holes 70 in test board 32.

In rejecting claims 9 through 12, 14 through 16, 18, and 20 through 22, the Office indicates that Haseyama et al. discloses a substrate comprised of test board 32 combined with structural elements of IC socket 200 mounted on test board 32. Specifically, the Office indicates the substrate comprises the combination of test board 32, a contact unit 23 and a positioning plate 36. (See Haseyama et al., Figs. 10 and 11.) Claim 9, as amended, recites the limitation of “a one-piece substrate bounded by a first substantially planar surface and an opposing, second substantially planar surface.” Claim 9 further recites that the one-piece substrate has “an aperture including a seat portion opening onto said first substantially planar surface of said one-piece substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said one-piece substrate.”

Applicant respectfully submits that Haseyama et al. does not teach or suggest these limitations. Rather than being a one-piece substrate, the substrate cited by the Office as being disclosed in Haseyama et al. comprises the combination of test board 32 with portions of IC socket 200 including contact unit 23 and positioning plate 36. Therefore, the substrate disclosed in Haseyama et al. does not teach or suggest an aperture including a seat portion and a retaining portion, wherein all of these features are formed within a substrate of one-piece construction. Claim 9 also recites that the claimed retaining portion has “a first end *connected* to an opposing end of said seat portion.” (Emphasis added.) With the test board 32 and IC socket 200 structures of Haseyama et al., the Office has grouped together separate structural features 38 and 31 that are formed on separate parts of test board 32 and IC socket 200, and are, therefore, not “connected.”

It is noted that in the instant Office Action, the Office asserts that positioning plate 36 is not required to reject the claims. (Office Action at page 9, first paragraph.) However, the Office has, in fact, used positioning plate 36 in rejecting the claims, and specifically relies on positioning recesses 38 as being analogous to the “seat portion” recited in the claims. Therefore, Applicant respectfully submits that the Office’s assertion is improper.

Applicant further respectfully submits that it would not be obvious to form the test board 32 and IC socket 200 portions cited by the Office as a one-piece substrate, because Haseyama et al. does not suggest such a modification, but rather teaches away from it. Specifically, Haseyama et al. states that an object of the invention is to provide “an IC socket, a test method using the same and an IC socket mounting mechanism.” Accordingly, Haseyama et al. is directed to test board assemblies wherein the IC sockets are separately mounted to a test board and does not contemplate or has as an objective the formation of a one-piece substrate including all the limitations recited in claim 9.

In view of the above, Applicant respectfully submits that claim 9 is allowable over Haseyama et al. under the provisions of 35 U.S.C. § 103.

The nonobviousness of independent claim 9 also precludes a rejection of claims 10 through 12, 14 through 16, 18, and 20 through 22, which depend therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. See *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), see also MPEP § 2143.03.

Further, claim 10 recites that “said second end of said retaining portion *does not extend entirely through said one-piece substrate* to said opposing, second substantially planar surface.” (Emphasis added.) In rejecting claim 10, the Office cites Fig. 9 of Haseyama et al., which shows the aperture does not extend all the way through test board 32. However, Fig. 9 of Haseyama et al. illustrates a test socket embodiment wherein contact pins 30 are configured to connect to land parts 33 on test board 32, rather than being inserted into through holes 70 in test board 32. Since the Office has already cited through holes 70 as being analogous to the claimed aperture, the test socket embodiment of Haseyama et al. disclosing test board 32 with land parts 33 cannot be combined to reject claim 10.

Claim 15 and claims 16 and 18, in depending therefrom, recite “a volume of conductive filler material disposed in and filling at least a partial *depth* of said aperture.” (Emphasis added.) Applicant respectfully submits that Haseyama et al. does not disclose any conductive filler material filling a partial depth of an aperture, but instead is limited to disclosing a through hole 70 into which parts 71, 72, and 73 are press-fit to provide an electrical connections (See Haseyama et al., column 17, lines 1-15.)

In view of the above, Applicant respectfully submits that claims 10 through 12, 14 through 16, 18, and 20 through 22 are also allowable over Haseyama et al. under the provisions of 35 U.S.C. § 103.

Obviousness Rejection Based on U.S. Patent No. 6,229,320 to Haseyama et al. in View of Patent Application Publication US 2002/0075025 A1 to Tanaka

Claims 13 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haseyama et al. (U.S. Patent No. 6,229,320) in view of Tanaka (Patent Application Publication US 2002/0075025 A1). Applicant respectfully traverses this rejection, as hereinafter set forth.

Tanaka teaches a semiconductor testing tool having a socket casing 2 with internal lead wires 8 (Figs. 1 and 3). The internal lead wires 8 are assertedly obvious to combine with the substrate of Haseyama et al. to beneficially reduce the number of structural elements of the test tool.

Claims 13 and 17 depend from claim 9. As discussed above, amended claim 9 recites the limitations of “a one-piece substrate bounded by a first substantially planar surface and an opposing, second substantially planar surface and having at least one conductive trace” and “an aperture including a seat portion opening onto said first substantially planar surface of said one-piece substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said one-piece substrate.” Moreover, claim 9 indicates that the aperture “seat portion”, the aperture “retaining portion” and the “at least one conductive trace” are all structural features of the same one-piece substrate.

For the same reasons as described above, neither Haseyama et al. nor Tanaka, alone or as combined, teach these limitations. Accordingly, claims 13 and 17, in depending from claim 9, are allowable over the cited references under the provisions of 35 U.S.C. § 103.

Claim 17 also depends from claim 15, which recites the limitation “a volume of conductive filler material disposed in and filling at least a partial depth of said aperture.” Applicant respectfully submits that neither of the cited references teach or suggest this limitation, and that claim 17 is allowable for that reason as well.

Obviousness Rejection Based on U.S. Patent No. 6,229,320 to Haseyama et al. in View of JP 2000-123935 to Kawaguchi

Claim 23 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Haseyama et al. (U.S. Patent No. 6,229,320) in view of Kawaguchi (JP 2000-123935). Applicant respectfully traverses this rejection, as hereinafter set forth.

Kawaguchi teaches a test socket 1 for electronic parts having contact pins 20 with spiral coil springs 20a having two or more coil turns (see Abstract). The Office indicates it would be obvious to use two or more coil turns for the spring contacts of Haseyama et al. to prevent damage and provide better contact with the solder bumps.

Claim 23 depends from claim 9. Claim 9, as amended herein, recites the limitations of “a one-piece substrate bounded by a first substantially planar surface and an opposing, second substantially planar surface and having at least one conductive trace” and “an aperture including a seat portion opening onto said first substantially planar surface of said one-piece substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said one-piece substrate.” Moreover, claim 9 indicates that the aperture “seat portion”, the aperture “retaining portion” and the “at least one conductive trace” are all structural features of the same one-piece substrate.

For the same reasons as described above, neither Haseyama et al. nor Kawaguchi, alone or as combined, teach these limitations. Accordingly, claim 23, in depending from claim 9, is allowable over the cited references under the provisions of 35 U.S.C. § 103.

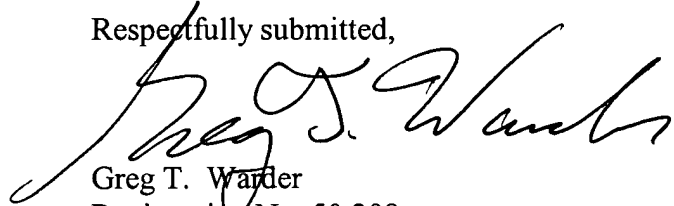
ENTRY OF AMENDMENTS

The amendment to claims 9, 10, 12 through 14, 16 through 18, 20, and 21 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application.

CONCLUSION

Claims 9 through 18 and 20 through 23 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Furthermore, Applicant notes that claim 9 is considered to be generic, and upon allowance of a generic claim, any non-elected species claim depending therefrom would also be allowable. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Greg T. Warder", is written over the typed name and address.

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